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EXAMINER	
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ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/502,500	BOGDAHN ET AL.	
	Examiner	Art Unit	
	JASON L. LAZORCIK	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 September 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4,6-11 and 21-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,6-11 and 21-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

Claims 1-2, 4, 6-11, 21-29 are pending for consideration on the merits

Claims 3, 5, 12-20, and 30 are canceled

Claims 1 and 29 have been amended by Applicants reply dated September 29, 2008

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.,* 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-2, 4, 6-9, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over French Patent to Boscher (FR 2,767,810 – Please note the basis for the rejection is presented with reference to the English language translation from FLS, Inc.).

Broadly, Boscher teaches a method of drawing a glass ingot into a capillary article having external and internal diameters of highly precise dimensions.

The method comprises first supplying said ingot to the heating zone of a furnace to heat soften the glass preform (Pg 6, lines 17-34). With particular reference to the following excerpt figure 2, Boscher discloses a "draw-off device" (2) for use in a vertical drawing method whereby a glass strand is drawn from the heat softened glass at a "controlled drawing speed". The draw-off device (2) comprises a "first draw-off unit" (4, 12) including a "reference rolling body" (4) and "at least one auxiliary rolling body" (12) distributed about the circumference of the drawn glass strand (33).

The draw-off device (2) further comprises "at least one additional draw-off unit" (14, 16) including a plurality of rolling bodies (Claim 3). The plurality of rolling bodies (14, 16) are adapted to provide an adjustable contact pressure with a "means of pressure" (Pg /7, lines 20-29, and Pg /10, lines 5-19) or "a damper" (**Claim 9**) which is understood to be "movable in a direction perpendicular to the long axis of the glass strand" (**Claim 4, 6**).

FIG. 1

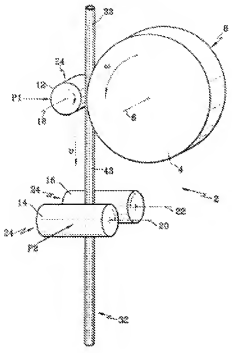
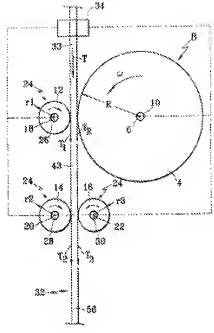


FIG. 2



(I) Drawing Speed is Controlled by Setting the Speed of the Reference Rolling Body

The reference specifically teaches (Page /2, Lines 16-26) that "the drive member (4) provides the rod with exactly the speed needed for the diameters to be produced. The moderate pressure exerted on the rod eliminates any risk of damaging the rod" and that "a relatively moderate pressure of the rod on the drive member allows one to obtain a rolling contact without any sliding of the rod on the drive member". Continuing, the instant reference discloses (Pg /7, lines 4-9) that "The mechanism 2 includes a speed servo control motor 10. This motor is equipped to impart to the wheel 4 rotational speed ω while keeping this speed constant even when the wheel 4 is subject to a variable strength torque. Such a motor is already known." From the above passage, it is

understood that the drawing speed of the glass strand is "controlled" via the rotational speed of the reference rolling body (4) as claimed.

(II) Weight of Tube Causes Varying Torque Acting on Rolling Bodies Due to Variations in Tube Diameter

Boscher teaches that the speed of the reference rolling body is controlled responsive to a sensor device (34) that measures the external diameter of the tube (32) upstream from the wheel (4). The diameter of the tube is correlated to the weight of the tube and the weight of the tube influences the torque acting on each of the rolling bodies placed in a non-slip contact with the tube. Where the diameter of the tube, and thus the weight of the tube, varies in time and since the weight of the tube influences the torque applied to the rolling bodies in contact with the tube, the reference and auxiliary rolling bodies are each construed to have a respective varying torque acting thereon. This assessment is confirmed in the instant reference wherein Boscher teaches that the "drive member is capable of having a constant speed when the torque exerted on the drive member varies" (Page /3, lines 5-6).

Boscher further recognizes the effect of stress imparted to the upstream drawing process by a the downstream cutting operation. Specifically, Boscher notes that "the presence of cutting devices downstream creates a discontinuity that normally results in variations of stress and of deformation in the area of the rod traction upstream". It follows from the foregoing that "a value of torque of said reference rolling body" and "a

contact pressure force" (**Claim 7**) are regulated at least in part with respect to "a variable weight of the drawn-off glass strand".

(III) Traction Force on the Reference Rolling Body and Auxiliary Rolling Body are Identical

As noted above, the reference rolling body is subject to a varying torque by virtue of the variable diameter/weight of the glass tube. At the surface of the glass tube, this applied torque is equal to "the traction force" between the glass tube and the reference rolling body. Boscher teaches that the auxiliary rolling bodies are set to provide an equal traction force 1) between the glass tube and the reference rolling body and 2) between the glass tube and the auxiliary rolling bodies. Specifically, Boscher states that the drive member and the traction member are equipped to exert on the rod some "respective traction forces (T_R, T_i) that are identical to one another" (Claim 6).

Since the traction force at the reference rolling body varies with the diameter/weight of the glass tube and since the auxiliary bodies apply the same traction force as the reference body, the torque acting on the auxiliary rolling bodies is necessarily adjusted based on the weight of the glass tube or responsive to "a value correlated to the torque acting on said reference rolling body".

(IV) Boscher is silent regarding a step to "equalize the torque" acting on the reference rolling body and the auxiliary/additional rolling bodies

The Boscher reference is silent regarding the recited limitation wherein "the torque acting on said at least one auxiliary rolling body and the torques acting on said additional rolling bodies of said at least one additional draw-off unit are adjusted (based upon the determined value correlated to the torque acting on said reference rolling body) so as to equalize the torque acting on said reference rolling body, the torques acting on the at least one auxiliary rolling body, and the torques acting on the additional rolling bodies.

(V) Equal torques acting upon the reference, auxiliary, and additional rolling bodies is an obvious modification over the Boscher disclosure in view of the ordinary level of skill in the art at the time of the invention.

As acknowledged by Applicant in the instant reply, Boscher teaches that the reference and auxiliary bodies are configured to apply "equal traction forces on the tube". These conditions are substantially identical to those disclosed in Applicants Specification wherein Applicant states that "Ideally, all of the rolling bodies of the draw-off unit exert the same forces on the glass strand".

At the surface of each individual rolling body, the torque force is equivalent to the "traction forces on the tube" since the tube is held against the rolling bodies in a non-slip condition. The torque applied by each of the rolling bodies (e.g. reference, auxiliary, and additional) is directly dependent upon the individual diameter of each body and the rotational force of each respective drive motor. Therefore, for two rolling bodies with

equal traction forces, the torques are equivalent only if the radius of each roller is equivalent.

Boscher is silent regarding this particular condition, namely that the radii of the reference and auxiliary rolling bodies are identical to each other. In the Boscher disclosure, the reference and auxiliary rolling bodies are depicted to have different radii, however Boscher neither explicitly nor implicitly restricts relative diameters of these rolls.

With respect to the criticality of the rollers radius in the draw off apparatus, Applicant appears to acknowledge in the Specification (see page 4, lines 12-17) that differences in the diameter of rollers in the apparatus are conventionally encountered due to variances in roller manufacture and are even to be expected to arise though normal course of routine equipment wear. Specifically, Applicant acknowledges that "The torques of the auxiliary rolling body or the auxiliary rolling bodies may differ from the torque of the reference rolling body for many reasons (e.g. different speeds, outer diameters, or non-circularity)". It is only in Applicants "ideal" scenario (Page 4, line24-26) wherein the torques applied by the reference and auxiliary rolling bodies are equivalent.

In view of the forgoing, the Examiner concludes that equal roller diameters for the reference and auxiliary rolling bodies, and consequently application of equal torques on

said bodies, is insufficient to patentably distinguish the claimed invention over that disclosed in the prior art when viewed in light of the ordinary level of skill at the time of the invention and absent compelling evidence of unexpected results.

Although not expressly disclosed in the Boscher reference, one of ordinary skill in the art would have been fully capable of specifying the respective diameters of the reference and auxiliary rollers of the Boscher apparatus. The impact of roller diameter upon the torques generated at the glass tube surface would have been fully predictable by one or ordinary skill, and it follows that specification of appropriate diameters would have fallen well within the purview of ordinary engineering endeavor at the time of the invention. Absent compelling evidence of unexpected results, one of ordinary skill in the art would have reasonably arrived at Applicants claimed configuration through no more than routine experimentation and optimization of the Boscher disclosed apparatus.

(VI) Boscher is silent regarding conditional engagement of second draw off unit additional rollers

With respect to **Claim 8**, Boscher teaches that the contact pressure P1 of the first draw-off unit and in the second draw-off unit may each be selected to provide a contact between the rollers and the glass strand surface which does not slip during the drawing process (Page /10, lines 5-19). The reference is silent regarding the particular details as recited in the instant claim wherein "when a predetermined maximum contact pressure force is exceeded" in the first draw off unit, the second draw off unit are

engaged with the glass strand and/or the contact pressure force is increased between the glass strand and the second draw-off unit.

(VII) Conditional engagement of second draw off unit is obvious in view of the ordinary level of skill in the art at the time of the invention.

It is however the Examiners position, in the absence of any compelling and unexpected results to the contrary, that the claimed protocol for the engagement of pressing force upon the glass strand would have been a merely obvious extension over the prior art teachings of Boscher. Specifically, it would have been obvious for one of ordinary skill to seek to minimize marring of the drawn strand by minimizing both the amount and degree of physical contact with the apparatus. To this end, the claimed sequential engagement protocol for the first and second draw-off units would have presented a merely obvious alternative to the explicit prior art disclosure for one of ordinary skill seeking to minimize the potential for surface marring of the glass strand.

(VIII) Boscher is silent regarding the particular details of the roller control algorithm

Regarding **Claim 29**, Boscher teaches a method of drawing a cylindrical glass body. The prior art discloses essentially every element of Applicants claimed invention including the claimed heating zone, drawing device with reference rolling body and auxiliary rolling bodies which engage the glass body.

Boscher teaches that the reference rolling body is controlled by a constant speed motor which is responsive to the diameter of the glass rod. Since the diameter of the

rod is dependent upon a continually varying weight of the glass rod and since one objective of the Boscher process is a constant diameter product, it follows that Boscher controls the reference body speed in response to at least the diameter and/or weight of the glass rod.

Boscher next teaches that the auxiliary bodies are controlled to maintain a constant torque upon the glass body and thereby provide a non-slip contact between the drawing device and the glass rod. As with the speed of the reference rolling body, the value of torque required to maintain the non-slip contact is expected to vary with the weight and diameter of the drawn glass rod. The reference further teaches that the Auxiliary bodies are controlled to maintain a constant applied torque value in response to a varying speed of the reference body, in response to a varying weight of the drawn glass rod, and in response the diameter of the glass rod.

The reference does not make explicit the particular details of the control algorithm as presently claimed by Applicant. Specifically, Boscher is silent regarding determining a setpoint drawing speed (input N), determining "a reference torque value" applied to the reference rolling body, determining an auxiliary rolling body torque value" applied to the auxiliary rolling body, determining a correction value (signal K) by comparing the reference and auxiliary torque values, and applying the input N and signal K values to adjust the torque applied to the auxiliary rolling body.

(IX) The recited control algorithm constitutes an obvious extension over the Boscher disclosed process for one of ordinary skill in the art at the time of the invention

Although the instant reference does not make explicit the above limitations, it is the Examiners position that such a control algorithm would have represented a minor and trivial extension over the Boscher teachings for one of ordinary skill in the art at the time of the invention. The Boscher reference implicitly teaches the use of such a control architecture by stating that the auxiliary body maintains a controlled torque upon the glass surface irrespective of the speed of the reference rolling body. The details of applying such a control algorithm, specifically as presently claimed by Applicant, would have presented a trivial extension over the prior art teachings for one of ordinary skill in the arts.

Claims 10, 11, and 21-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boscher (FR 2,767,810) as respectively applied to claims 1-8 above, and further in view of the W. Haldenwanger company ceramic roller product brochure (Publicly available; August 19, 2000) and the NIST materials property data summary for sintered silicon carbide.

Boscher teaches that the reference roller (4) is At least partially "made out of a hard material such as steel" and that "coefficient of friction of the body of drive on the stem is low". Additionally in a preferred embodiment the reference teaches that "The three rollers of traction 12, 14, 16 having a cylindrical face 24 less hard than wheel 4". Although the reference teaches that the auxiliary rollers should have a higher coefficient of friction than the reference roller, Boscher does explicitly limit the coefficient of friction

of the roller surface as set forth in Claim 10, 21,23,25,27 nor does the reference explicitly disclose the use of a roller surface containing asbestos, asbestos substitutes, or SiC as per Claims 11, 22, 24, 26, 28.

Although Boscher does not explicitly teach the use of silicon carbide rollers for the instant application, such rollers were commercially available on the open market from at least the W. Haldenwanger company (http://web.archive.org/web/20001118093500/www.haldenwanger.de/index2.cfm?rubrik=Halsic-R/Halsic-I) at the time of the invention. Specifically the product brochure for the Halsic brand silicon carbide industrial rollers indicate (See English Language Equivalent Brochure) that the rollers share the following characteristics: "absolute dimensional stability despite extreme mechanical strain in high temperature applications – very good thermal shock resistance – excellent corrosion resistance – and low specific weight" (Pg 2, first paragraph). One having no more than an ordinary level of skill in the art at the time of the invention would have recognized the benefits of applying the heat resistant Halsic brand rollers in the elevated temperature Boscher glass drawing process. Specifically, it would have been obvious to on of ordinary skill to implement the commercially available rollers in the Boscher apparatus when seeking to maximize useful roller lifetime (**Claims 11, 22, 24, 26, 28**).

A property summary provided by NIST for sintered Silicon Carbide of the general type utilized in the Haldenwanger rollers

(http://www.ceramics.nist.gov/srd/summary/scdscs.htm) further reveals that such rollers would reasonably be expected to present a coefficient of friction in the range of 0.4 to 0.7 which clearly overlaps the claimed range of 0.2 to 0.5 (**Claim 10, 21,23,25,27**).

Response to Arguments

Argument #1)

Applicant argues (page 10) that Boscher does not show or suggest the recited steps of;

1) determining the torque on the reference rolling body,
2) using the determined torque as a setpoint,
3) adjusting the torque acting on the at least one auxiliary rolling body and the torques acting on the additional rolling bodies based upon the setpoint in order to equalize the torques acting on the reference rolling body, the at least one auxiliary rolling body, and the additional rolling bodies.

In support of this position, Applicant asserts that wheel 4 and 12 in the Boscher apparatus apply "equal traction forces on the tube". Applicant continues by asserting that since wheels 4 and 12 have different diameters and since they apply the same traction force then the wheels necessarily "apply unequal torques on the glass tube".

Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection as presented above. Further, Applicant is advised according to the following;

Torque is defined as the product of force and lever arm and as such is specific to a point or a body of reference. For example torque force acting at the surface of the reference rolling body would be defined as the product of force and the radius of the reference rolling body. In the same manner, the torque force applied at the surface of the glass tube would be defined as the product of force and the radius of the glass tube. In short, although the forces may be equivalent in magnitude, the torque acting at the surface of the reference rolling body is not equivalent to the torque applied "on the glass tube".

With respect to the instant arguments, Applicant has provided substantially no evidence to suggest that non-equal torques are "applied on the glass tube" and such an allegation runs contrary to Applicants own assessment of the Boscher reference.

Specifically, Applicant acknowledges that the Boscher apparatus applies "equal traction forces on the tube". Where equal traction forces are applied at the surface of the *cylindrical* Boscher glass tube, it should appear evident that the Boscher wheels 4 and 12 actually do apply nominally equivalent torques "on the glass tube". In fact, application of nonequivalent torques upon the glass tube surface under the disclosed non-slip conditions of Boscher would necessarily generate a stress differential through

the cross-section of the tube and result in a curving or bending the heat softened glass tube. Such a condition does not exist in the Boscher process. Rather, Boscher states (see page 5, last paragraph of the English language translation) that the disclosed conditions "avoid causing ... disequilibrium in the lateral stresses" upon the glass tube.

In short, Applicants allegations purporting that Boscher applies uneven drawing torques upon the glass tube or that such a process results in an undesirable distribution of the forces for guiding the glass tube being drawn stand in contrast to the Boscher disclosed process. Further, since Applicant has provided no conclusive evidence in support of the instant allegations, said allegations are held to be mere conjecture and attorney argument.

The Official policy regarding Attorney argument is clearly outlined in MPEP §2145 [R-3];

> "Attorney argument is not evidence unless it is an admission, in which case, an examiner may use the admission in making a rejection. See MPEP § 2129 and § 2144.03 for a discussion of admissions as prior art. The arguments of counsel cannot take the place of evidence in the record. In re Schulze, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965); In re Geisler, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997) ("An assertion of what seems to follow from common experience is just attorney argument and not the kind of factual evidence that is required to rebut a prima facie case of obviousness."). See MPEP § 716.01(c) for examples of attorney statements which are not evidence and which must be supported by an appropriate affidavit or declaration.

Conclusion

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON L. LAZORCIK whose telephone number is (571)272-2217. The examiner can normally be reached on Monday through Friday 8:30 am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven P. Griffin/
Supervisory Patent Examiner, Art Unit 1791

JLL